CT Colonography: Clinical case review

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Disclosures

• Consultant, Vital Images
Part I CTC

• Overview of different morphologic types:

  » Focal polyp vs stool
  » Sessile lesion and flat lesions
  » Pedunculated lesion
  » Cancer vs collapse or muscular hypertrophy
Part II CTC

• **Clinical case reviews**
  
  » Systematic/ efficient review - 3D + 2D
  » How to evaluate a focal lesion - TP vs FP
  » Reporting of cases (C-RADS)
Key patient factors (input)

Bowel prep + with tagging

Before CT  At CT
Morphological types of lesions

• polyp vs stool
Stool tagging

Tagging with barium and/or iodine is widely being used:

- Densely tags the stool to decrease FP

*Lefere P, Radiology 2002;224:393-403*
Tagging techniques

Tagging with **barium and/or iodine** is widely being used:

- Densely tags the stool to decrease FP
- Coats the surface of polyps
Tagging techniques

Tagging with **barium and/or iodine** is widely being used:

- Densely tags the stool to decrease FP
- Coats the surface of polyps
- Tags the fluid
Morphological types of lesions

• Sessile vs flat lesion
  (more details later)
12 mm sessile adenoma

400/ 10 W/L
Morphological types of lesions

• pedunculated lesion
12 mm pedunculated polyp:
Morphological types of lesions

• Advanced mural cancer vs collapse or diverticulosis/itis
Advanced mural lesion of cancer
Part II CTC

• Clinical case reviews
  » Systematic/ efficient review - 3D + 2D
  » How to evaluate a focal lesion - TP vs FP
  » Reporting of cases (C-RADS)
Systematic review of case

• 3D as primary review:
  » Use 3D as primary detection
  » Use 2D MPR to further characterize
    » Density, location in colon

• 2D as primary review:
  » Use 2D as primary detection
  » Use 3D to further characterize
    » (eg) nodular fold or polyp on a fold
Basic principles

• 3 steps to identify a focal lesion
Reading tips

• To measure lesion:
  » Measure long axis of polyp (excluding stalk)
  » Measure base of sessile lesion
  » 2D vs 3D

12 mm
C-RADS

• **C0** = incomplete study
• **C1** = normal colon or benign lesions
• **C2** = intermediate polyps
  » < 3 in number of polyps 6-9 mm in size
• **C3** = clinically significant lesions
  » ≥ 1 cm lesion(s) or ≥ 3 in number of 6-9 mm lesions
• **C4** = advanced mural lesion

Zalis et al, Radiology 2005;236:3-9
C-RADS

• *Extra-colonic findings:
  » E0 inadequate study
  » E1 normal or anatomic variant
  » E2 clinically unimportant
  » E3 likely unimportant (may need work-up)
  » E4 clinically important

* In screening cohorts (asx), 8-11% will have E3-E4
Systematic review of case:
3D as primary review

- **Quick coronal overview** to assess image quality and anatomy

- 2D MPR axial review (polyp W/L) in one position

- **3D fly-through paths (3-4):**
  1. Supine- retrograde from rectum to cecum
  2. Supine- antegrade from cecum to rectum
  3. Prone- retrograde from rectum to cecum

- 2D MPR axial review (400/10 W/L) to assess mural lesions and then evaluate ECF
Case 1

Retrograde:

to cecum

Antegrade:

to rectum
Case 1- Images of normal CTC case

Normal 3D of cecum (demonstrates complete exam)
Case 1 Report

• Colon:

  » *Image quality:* There is very good *distention* of the six segments of the colon between the two positions… A small amount of retained *fluid* is seen in the right colon. No significant retained *stool* is present.

  » *Colorectal lesions:* No clinically significant colorectal polyp is seen. No advanced mural lesion or focal obstruction is present.

  » C-RADS *Category 1* (negative)
Case 2
(60 yr old female for screening)
18 mm sessile TC polyp

CAD marking of polyp
Case 9
18 mm sessile TC lesion
Morphological types

• **Polypoid**
  » Pedunculated
  » Sessile

• **Non-polypoid**
  » Superficially elevated
  » Flat
  » Depressed
Case 3 - 78 yr old female with anemia (incomplete OC and BE)
Case 3
2D MPR views of tumor

Pre contrast- LPO (25 HU)

Post contrast- supine (55 HU)
Case 3
3D transparency view
Case 4-
78 yr old male for screening, prior BE with 8 mm sig polyp, no f/u
Case 4

Pathology of chronic diverticulosis with inflammation, fat necrosis/walled off perforation
Case 5- Avg risk screening CTC
Case 5

SUPINE

PRONE
Case 5

- Bookmark as you go to give 3D overview
- Call what you are confident in, NOT what you are less sure of
Reporting of multiple lesions

• First, be definitive about ≥ 10 mm lesions and/or advanced cancers
  » Recommend OC for lesions ≥ 6 mm

• Report the 6-9 mm lesions that you are confident in

• Don’t overcall multiple diminutive or small polyps you are not sure of
  » Let OC find them, rather than look for FP
How to read CTC with decreased or poor image quality?

- Evaluate for advanced mural lesion
- Undercall the polyps, unless certain
Decreased image quality

**Reporting:** CAN exclude advanced mural cancer!!
Summary of Case Review

• Learn a systematic efficient approach (3D integrated with 2D)

• With tough cases, find the big lesions
  » Don’t sweat the small stuff

• Organized reporting with C-RADS
  » Communicate with gastroenterologists, internists, surgeons!